SCIENTIFIC SERIALS

Proceedings of the Linnæan Society of New South Wales, vol. iv. Part 3, 1879, contains:—W. A. Haswell, on the Australian amphipoda, with thirteen plates, describes many new species and several new genera; of these latter, one, Amaryllis, is unfortunately already familiar to the botanist; another, Glycera, has been in use since the days of Sayigny as a generic name in the animal kingdom; on the phyllosoma stage of *Ibacus peronii;* notes on the anatomy of birds; on the cylostomatous polyzoa of Port Jackson.—E. P. Ramsay, notes on birds from the Solomon Islands.—Prof. F. W. Hutton, on the genus Phalacrocorax.—W. Macleay, on the Clupeidæ of Australia.—Dr. James Cox, on the genus Cypræa.—Rev. J. Tenison Woods, on some new Australian echini (plates 13 and 14), describes *Hemiaster apicatus* (sp. n. and *Phyllacanthus parvispina* (sp. n.), and gives a revised list of all Australian echini (fifty-eight in number); on *Heterosammia michelinii* (plate 15); on a new species of Disticophora; on some fossils from Fiji; on some post-tertiary fossils from New Caledonia.—R. B. Read, on *Doris arbutus*, Angus (plate 17).

Atti della R. Accademia dei Lincei, Fasc. 4, vol. iv., March.—Light and the transpiration of plants, by Dr. Comes.—The Ciminna volcano, by S. Verri.—On *Edwardsia claparedia* (*Halcampa clap.* of Panceri), by Dr. Andres.—Fierasfer, by Prof. Emery.—On some ancient eclipses of the sun, and that of Agathocles in particular, by S. Celoria.—On movements of a surface which does not constantly touch another fixed surface, by Prof. Gautero.—The Bacillus malariæ in the region of Selinunte and Campobello, by S. Tommasi-Crudeli.—Studies in experimental pathology on the genesis and the nature of abdominal typhus, by Prof. Tizzoni.—On the variations of area described by the moon about the earth, produced by solar action, by S. de Gasparis.—Reply on the secular variations of the magnetic needle in Rome, by Dr. Keller.—On neutral tungstates of cerium, by SS. Cossa and Zecchini.

Fasc. 5, April.—The colours of animals, by Dr. Camerano.—On some noteworthy configurations of points, straight lines, and planes, of conics and of surfaces of the second order, by Dr. Veronese.—On some observations of S. Klocke on striæ of dissolution of chrome alum, by Prof. Uzielli.—On yellow incrustation of the Vesuvian lava of 1631, by S. Hofman.—On bromocamphor, by Prof. Schiff.—On the chemical constituents of *Stereocaulon vesuvianum*, by Prof. Paterno.—On some new reactions of guanina, by Prof. Capranica.

THE *Bulletin de l'Académie Royale des Sciences de Belgique*, No. 3.—Researches on the nervous system of the Arthropoda; constitution of the œsophagean ring, by M. Liénard.—Notice on the Austro-American Cucurbitaceæ of M. Ed. André, by M. Cogniaux.—Aspect of the planet Mars during the opposition of 1879, and observations of the red spot of Jupiter and of the spots of Venus, by M. Zerby.—Several reports on memoirs.

THE *Rivista Scientifico-Industriale*, No. 8, April 30.—The nefodoscope, a new instrument for showing the direction of motion of clouds, by Prof. Fornioni.—The Etna observatory, by S. Da Roberto.—Considerations on regular polygons, by Prof. Mantino.

Journal of the Franklin Institute, June.—Influence of speed on the frictional and air resistances of an unloaded steam-engine and its connected lines of shafting, by Chief-Engineer Isherwood.—The decimal gauge, by R. Briggs.—Review of the report on the Irwin injector, by W. Lewis.—Eye memory (continued), by C. G. Leland.—Nodal estimation of the velocity of light, by P. E. Chase.—Early use of anthracite coal in Pennsylvania.—On the adhesion of belts, by J. H. Cooper.

Reale Istituto Lombardo di Scienze e Lettere, vol. xiii. Fasc. viii. and ix.—Geo-mechanical solution of some problems of interpolation, by Prof. Jung.—Compensation of *proportional errors* by a given system of direct observations, by the same.—On cooling of a liquid in contact with a body in course of liquefaction or of vaporisation, by S. Cantoni.—Influence of temperature on the distribution of magnetism in a permanent magnet, by Dr. Poloni.—A curious phenomenon presented by boiling liquids, by Dr. Grassi.

Fasc. x. and xi.—On the origin of red earth in the vegetation of the calcareous soil, by Prof. Taramelli.—On the problem of the tautochrone, by Prof. Formenti.—On two new species for the Italian flora, by Prof. Ardissone.—On the aberration of sphericity in lenses of ordinary strength and aperture, and in centred dioptric systems, by Prof. Ferrini.—On the necessity in Italy of a geological institute independent of the R. Corps of Mining Engineers, by Prof. Taramelli.—On neuropathic arthritis, by Prof. de Giovanni.—On *Cilio-flagellati*, by Prof. Maggi.—On a theorem of Abel and some of its applications, by Prof. Beltrami.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, June 17.—"Notes of Observations on Musical Beats." By A. J. Ellis, F.R.S.

This paper gave the results of three years of observations made for the purpose of discovering the cause and amount of error in Appunn's reed tonometers, and for obtaining materials for the writer's "History of Musical Pitch" (NATURE, vol. xxi. p. 550). The principal results were these:—In free air the number of beats between two musical notes are exactly equal to the difference of their pitch, or number of double vibrations made in one second by the lowest partial or prime; this was proved by the exact agreement of the pitch of the forks in Scheibler's tonometer, determined by such beats, with their measurement by Professors McLeod and Mayer, and with the results of Koenig when reduced to a uniform temperature. For this reduction the coefficient by which the number of vibrations must be multiplied for each degree Fahrenheit varies from ·00004 to ·00006, and may be assumed as ·00005 (forks flattening by heat and sharpening by cold). It differs for different forks, and depends on the action of temperature on elasticity. Tuning-forks are very stable, proved by the fact that Scheibler's extreme forks have not varied by one-tenth of a vibration in a second since his death in 1837, and that a fork measured and marked by himself as 438 single vibrations, that is, 219 double vibrations, fifty years ago, although much rusted, has not lost more than 0·3 d. vib. Beats which take place in confined compressed air, as in Appunn's reed tonometers, are accelerated by 76 in 10,000, or, say ¾ per cent., as a mean; proved by taking the beats within and without the box of the tonometer, and determining the pitch of the reeds by beats with Scheibler's forks, the two means agreeing precisely. All beats are beats of the simple partial tones of which the compound tones are made up; proved by the bell-like beats of the disturbed unisons and higher consonances in Appunn's tonometer, while the "surge" of the non-beating partials was distinctly evident, and by the beats of the higher upper partials themselves of very low and very compound reed tones in a single note. The independent existence of the partial tones, without any assistance from reinforcing resonance cavities, was proved by determining the pitch of low reeds by the beats of their upper partials with the prime or lowest partial of different forks; thus the pitch of a reed of 31·47 vib. was determined by beats with partials 7, 9, 10, 11, 12, 13, each with a different fork, and the results varied only from 5 to 9 in the second place of decimals; the pitch of a reed of 11·90 vib., of which the prime was quite inaudible, was determined by beats with partials 20 and 28, giving 11·88 and 11·91 respectively. The best mode of constructing a tuning-fork tonometer was shown to be dependent on the fact that all tuning-forks contained their own octave, or second partial, distinctly enough to count beats between it and a fork forming its approximate octave, so that there was no occasion to tune an octave. Practical directions were given for this construction. Practical directions for performing the experiments on Appunn's tonometers have been deposited at the South Kensington Museum, where the instruments used exist, especially for the delimitation of the higher considences and consonances where the terms of the ratios are any of the numbers 1 to 16.

"Preliminary Note on the Ossification of the Terminal Phalanges of the Digits," by E. A. Schäfer, F.R.S., and F. A. Dixey, B.A.

The diaphyses of the ungual phalanges of the digits offer an exception to the usual mode of ossification of diaphysial bones (including the other phalanges) in the fact that the calcification of the cartilage and its attendant changes begins at the tip and not in the centre of the diaphysis. The subperiosteal intramembranous ossification also commences at the same point—the tip, namely, of the cartilage—as a cap-like expansion over the end of the cartilage. The irruption of the osteoblastic subperiosteal tissue also first occurs here, so that this part seems to correspond morphologically with the centre of the shaft of other long bones. The expanded portion of the phalanx which bears the nail, claw, or hoof is entirely formed by an outgrowth of the subperiosteal bone, and is not preceded by cartilage.

A detailed account of the mode of ossification of these phalanges will be shortly published.

"The Aluminium-Iodine Reaction," by J. H. Gladstone, Ph.D., F.R.S., and Alfred Tribe, F.C.S., Lecturer on Chemistry in Dulwich College.

"Note on the Discovery of a Freshwater Medusa of the Order Trachomedusæ," by E. Ray Lankester, F.R.S. (See NATURE, vol. xxii. p. 147.)

"Note on the Bearing on the Atomic Weight of Aluminium of the Fact that this Metal occludes Hydrogen," by J. W. Mallet, F.R.S.

Zoological Society, June 15.—Prof. W. H. Flower, F.R.S., president, in the chair.—The Secretary exhibited the skin of an antelope received from the Gaboon, and remarked that it appeared to belong to the female of an undescribed species of *Tragelaphus*, allied to *Tragelaphus spekii*, which he proposed to name *T. gratus*.—Dr. A. Günther exhibited and made remarks on a series of horns of the Sambur deer of Borneo.—Mr. W. T. Blanford made some remarks on the proper name of the Himalayan marmots, now living in the Society's Gardens, which he believed to be *Arctomys hodgsoni*.—Prof. Mivart called attention to the Medusæ, now living in the Victoria-Lily house, in the Botanic Gardens, Regent's Park.—Mr. Edward R. Alston read a paper on *Antechinomys* and its allies, in which he described the anatomy of that little-known marsupial. He regarded the four genera, *Phascologale*, *Antechinus*, *Podabrus*, and *Antechinomys* as constituting a sub-family of the *Dasyuridæ*, the first and the second, and the third and the fourth, being most nearly related to one another.—Mr. G. E. Dobson read a paper on some new or rare species of Chiroptera, in the collection of the Göttingen Museum. Amongst these was a new species of *Megaderma* from Australia, which, on account of its large size, Mr. Dobson proposed to name *Megaderma gigas*.—Mr. W. A. Forbes read a paper on the anatomy of *Leptosoma discolor*, and adduced further evidence to show that this bird is related not to *Cuculidæ*, but to the rollers (*Coraciidæ*).—A second paper by Mr. Forbes contained remarks on two rare Ploceine birds in the Society's collection (*Viaua splendens* and *Pytelia wieneri*).—Mr. Forbes likewise read some notes on the anatomy of a male Denham's Bustard, lately living in the Society's Gardens, and on its mode of "showing off" when alive.—Mr. Edgar A. Smith read the descriptions of twelve new species of shells from various localities. Specimens of all but two were in the collection of the British Museum.—Sir Walter Elliot, K.C.S.I., read some notes on the Indian Bustard, and its manner of "showing off," as observed by him in India.—Mr. F. H. Waterhouse read a list of the dates of publication of the several parts of Sir Andrew Smith's "Illustrations of the Zoology of South Africa."—Mr. A. W. E. O'Shaughnessy read the description of a new species of lizard of the genus *Anolis*, from Ecuador, which he proposed to call *Anolis buckleyi*, after its discoverer, Mr. Clarence Buckley.—Mr. Sclater read a paper containing a list of the certainly-known species of Anatidæ, with notes on such as have been introduced into the zoological gardens of Europe.—Mr. Wilfred Powell read some notes on the habits of the Mooroop (*Casuarius bennetti* of New Britain).

Anthropological Institute, June 22.—Edward B. Tylor, F.R.S., president, in the chair.—Mr Wilfred Powell exhibited a collection of ethnological objects from New Britain and New Ireland. Amongst them was a mask formed from a human skull and a sling which was chiefly remarkable for its great length.—Don Francisco P. Moreno exhibited two skulls from Patagonia (Rio Negro).—Prof. W. H. Flower, F.R.S., gave the substance of a paper on a collection of crania from the Fiji Islands. The two principal islands of this group are Viti Levu and Vanua Levu; until very recently we have had no skulls from either of these islands, all that have reached Europe having come from one or other of the small Eastern Islands. There has been for some time in the Museum of the Royal College of Surgeons one skull obtained from the hospital at Hobart Town, which was said to be Fijian, but this specimen is not at all typical, but rather misleading in its characters. These skulls (fourteen in number) were all found by the Baron Anatole von Hügel in the same cave in the Landongo district, quite the southern end of Viti Levu. No skull has ever been brought from the northern island, Vanua Levu. The most noticeable feature is the great similarity between the skulls; in every essential particular they are precisely alike, proving that they belong to a pure race. They are the longest and narrowest of any known, the average cephalic index being 66; they are also very high skulls. All these skulls are prognathous and platyrhine, the alveolar index being 102 and the nasal index 57. They are also mesosemes, having an orbital index of 85. A great difference is seen between these skulls and Samoan skulls, and five skulls from Vanua Velava, where the two races are brought into contact, show characters between these two extremes:—

	Bi		Hi		Ai		Ni		Oi
Fiji	66	...	74	...	102	...	57	...	85
Vanua Velava ...	72	...	75	...	101	...	50	...	88
Samoan	83	...	78	...	98	...	44	...	92

Meteorological Society, June 16.—Mr. G. J. Symons, F.R.S., president, in the chair.—T. W. Barry, M.D., A. W. Martin, and C. E. Peek, were elected Fellows, and Señor A. Aguilar and Dr. H. H. Hildebrandsson were elected honorary members of the Society.—The following papers were read:—Ozone in nature, its relations, sources, and influences, &c., from fifteen years' observations ashore and afloat under all condition, of climate, by J. Mulvany, M.D., R.N. The meteorological elements with which ozone is most intimately associated are such as occasion high vapour tension and a high degree of saturations therefore it is promoted by wind passing over a large aqueous expanse and by heat producing rapid evaporation. Hence heat if humid is no bar to atmospheric ozonisation, but no definite relation exists in the atmosphere between that *per se* and ozone; its relation to humidity is more definite and direct, but subject to many exceptions; in consequence of this relation it most abounds where its chemical qualities render it most useful. It appears to be formed in the upper strata and to be carried downwards by rain-drops, whose office is vehicular. The spherules of water which constitute clouds, and have their origin in radiation and condensation, have a similar office. Ozone does not appear to diffuse readily downwards, so that when the lower strata are robbed of ozone by jungle, &c., a considerable difference in the ozonic condition close to and at 170 feet above the surface may exist. The author is of opinion that no disease can be clearly traced to ozone as met with in the atmosphere.—The average height of the barometer in London, by Henry Storks Eaton, M.A., F.M.S.—Note on a waterspout observed at Morant Cays, Jamaica, March 23, 1880, by Lieut. Alfred Carpenter, R.N., F.M.S.—Account of a balloon ascent from Lewes in a whirlwind on March 23, 1880, by Capts. James Templer and H. Elsdale. — Results of meteorological observations made at Stanley, Falkland Islands, 1875–77, by William Marriott, F.M.S.—A new thermograph, by William David Bowkett.—The winter climate of Davos, by C. T. Williams, M.D., F.M.S. Among the high altitude sanitaria of Europe, Davos at present enjoys the greatest reputation, partly on account of its easy accessibility, and partly on account of certain peculiarities of position and shelter. The valley of Davos lies in the canton of the Grisons, between the valleys of the Lower Rhine and the Upper Engadine. The valley runs from N.N.W. to S.S.E. for about ten miles in length, with an average breadth of about a third of a mile, being for the most part of this extent a plain gently sloping towards the north, and varying in elevation from 5,400 to 4,500 feet. Davos Platz is 5,105 feet above the sea level. The author discusses the observations made during the four winters of 1876-7 to 1879-80. The peculiar effects of Davos winter climate seem to depend on (1) the rarefaction of the atmosphere; (2) its dryness; (3) the absence of strong currents, owing partly to shelter and partly to the uniform layer of snow spread around; and (4) the large percentage of the *direct* solar rays reaching the locality, owing to rarefaction of the air, and also the considerable amount of heat reflected from the extensive snow plain in front of the village of Davos Platz.

Royal Microscopical Society, June 9.—Dr. Braithwaite, vice-president, in the chair.—The following papers were read:—On the relative visibility of minute structures in solutions of phosphorus, sulphur, &c., by Mr. Stephenson.—On the life-history of the Diatomaceæ, illustrated by a large number of coloured drawings, by Prof. Hamilton L. Smith.—On a parabolised gas slide, by Dr. Edmunds.—On the structure and functions of scale leaves of *Lathrea squamaria*, by Mr. Gilbert.—On the interference-phenomena produced by luminous points, by

Mr. Woodall.—On an isophotal binocular microscope, by Mr. S. Holmes.—On the theory of microscopic vision, by Prof. Abbe.—Amongst the objects exhibited were new turntables by Dr. Matthews; slides illustrating invertebrate embryology, by the Naples Geological Station; and several new forms of microscopes and apparatus by Mr. Crisp.

PHILADELPHIA

Academy of Natural Sciences, February 17.—Germination of acorns, by Mr. T. Meehan.

March 2.—Report on plants introduced by means of the International Exhibition of 1876.

March 9.—Dr. H. Allen on the mammary glands of bats.

March 16.—Carcinological notes, No. 4, by J. S. Kingsley.

March 23.—On the gestation and generative apparatus of the elephant, by H. C. Chapman, M.D.

PARIS

Academy of Sciences, June 28.—M. Edm. Becquerel in the chair.—The death of M. Lissajous was announced.—The following papers were read:—Researches on the determination of wave-lengths of calorific rays at low temperatures, by MM. Desains and Curie. A beam of dark heat was sent through a slit to a grating of fine wire, opposite which was a rock-salt lens; beyond this lens the calorific image was formed, and examined with a thermopile. The results mainly agree with those of M. Mouton (by another method).—On the heat of vaporisation of anhydrous sulphuric acid, by M. Berthelot. This vaporisation, about 18°, absorbs − 5·9.—On some general relations between the chemical mass of elements and the heat of formation of their combinations, by M. Berthelot.—On M. Breguet's regulators with vanes, by M. Villarceau. M. Breguet has recently made three apparatus for Lisbon Observatory for determination of personal equations, and the mean errors of isochronism are, respectively, a fifteen-thousandth, an eighteen-thousandth, and a forty-thousandth. It is hoped to go further.—On a new species of the genus Dasyurus, from New Guinea, by M. Milne-Edwards. This is named *D. fuscus*; it comes nearest the Australian *D. hallucatus*.—Craniology of African negro races; dolichocephalic races, by MM. Quatrefages and Hamy.—Possible causes of variation in the results of anthracic inoculation of Algerian sheep; influence of infectant agents; applications to the theory of immunity, by M. Chauveau.—Results obtained in treatment of vines with sulphocarbonate of potassium, by M. Marés.—On the healthiness of the Isthmus of Panama, by M. de Lesseps. Many persons affected by yellow fever have landed there without restriction, but the fever has not at all spread. M. de Lesseps' opinion that quarantines could not prevent epidemics from spreading where their spread was favoured by atmospheric conditions, was called in question by M. Bouley.—On a new form of galvanometer, by M. Gostynski. Proportionality is gained to nearly 90°. The bobbin is continuous, or without slit for passage of an astatic system. A U-piece of aluminium wire hung by a cocoon fibre supports two astatic systems of the same kind, crossed at 45° and connected. A small mirror above the aluminium wire reflects the divisions of a semi-cylindrical scale.—On an apparatus for registering the law of motion of a projectile, &c. (continued), by M. Sebert. This relates to the case of the projectile meeting a sudden resistance, as when entering sand. A plan for recording the law of motion in the entire bore of the gun consists in having two guides and runners in the projectile; one runner is free, and on reaching the end of its course it removes a stop holding the other, which then begins its motion. The resistance of the air in part of the course might similarly be measured.—On the existence in tobacco-smoke of prussic acid, of an alkaloid as poisonous as nicotine, and of various aromatic principles, by MM. Le Bon and Noel. The alkaloid seems identical with the compound collidine, got in distillation of several organic substances.—Researches on the electric properties of collodion, with reflections on the nature of static electricity, by M. Leure. Collodion in thin sheets is negative with all bodies.—On transcendants which play an important part in the theory of planetary perturbations, by M. Callandreau.—On the application of the theory of sines of superior orders to the integration of linear differential equations, by M. Farkas.—Vibrations on the surface of liquids, by M. Lechat. Lagrange's supposition is incorrect, that below a very slight depth the influence of depth is *nil*.—Relation between the major and minor modes in the gamut agreed according to equal temperaments, by M. Ricard.—Strong and constant voltaic pile, furnishing results susceptible of regeneration by electrolysis, by M. Reynier. The zinc (unamalgamated) is in caustic soda solution, the copper in sulphate of copper solution, separated from the other by a rectangular vessel of parchment paper (several thicknesses). The electromotive force is 1·3 volt to 1·5 volt, according to concentration. The couple is regenerated by passing through it the current of a magneto-machine. M. Edm. Becquerel said the arrangement was not new, his father having used a similar one.—On the mechanical effects in a magnetic core from magnetising action of an electric current, by M. Ader. He has proved that all bars of magnetic nature submitted to a mechanical action of compression, torsion, or traction, tend to recover their original molecular arrangement under influence of the magnetising current.—Independent optical compass for ironclads, by M. de Fraisseix.—Thermal study of alkaline polysulphides, by M. Sabatier.—On the transformation of amylene and valerylene into cymene and benzenic carburets, by M. Bouchardat.—On the etherification of hydriodic and hydrochloric acids, by M. Villiers.—On anhydrous crystallised lime, by MM. Levallois and Meunier. This was found on the walls of a kiln of bauxite, for burning lime.—On the presence of iron in falls of dust in Sicily and Italy, by M. Tacchini. This iron is thought to have come from the Sahara.—On the organisation and the development of Gordians, by M. Villot.—On an acarian destroyer of the gallicolar phylloxera, by M. Pickard.—Zinc: its existence in the state of complete diffusion in all rocks of the primordial formation and in the waters of seas of all ages, by M. Dieulafait.—On the cretaceous formation of the Northern Sahara, by M. Rolland.—On the discovery of new mammalia in the phosphate of lime deposits of Quercy, by M. Filhol.—On the transmissibility of tuberculosis by milk, by M. Peuch. This was proved in pigs and rabbits which drank the milk of a diseased cow. MM. Bouley and Larrey made remarks on the subject.

VIENNA

Imperial Academy of Sciences, April 22.—The following, among other papers, were read:—A new synthesis of sulphydantoïn, by Herr Andreasch.—A new derivative of sulphydantoïn, carbonid sulphonacetic acid, by the same.—On some transformation-products of rufigallic acid and the so-called oxychinon, by Dr. Schreder.—Geological Researches in the Western Balkans and neighbouring region, by Dr. Joule.—Diluvial fauna of Zuzlawitz, near Winterberg, in the Böhmerwald, by Prof. Woldrich.

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